

REMARKS

Claims 27-30, 32-36, 38-43, 45-49 and 51-59 are pending in the application.

Claim 45 has been amended.

Claims 27-30, 32-36, 38-43, 45-49 and 51-59 stand rejected.

Amendments to the Claims

Claim 45 has been amended to correct an obvious typographical error. Claim 45 as originally filed was dependent on claim 44, which in turn was dependent on independent claim 40. Claim 44 has been canceled. The present amendment corrects the dependence of claim 45 to reflect a proper dependence on claim 40, without any dependence on an intervening claim. Applicant notes that the amendment does not narrow the scope of claim 45, which originally included all the limitations of claim 40 as a base claim. The amendment adds no new matter.

Rejection of Claims under 35 U.S.C. § 103

Claims 27-30, 32-36, 38-43, 45-49, and 51-59 stand rejected under 35 U.S.C. § 103(a), as being unpatentable over U.S. Patent No. 6,195,553 to Claffery et al. (“Claffery”), in view of U.S. Patent No. 5,596,719 to Ramakrishnan et al. (“Ramakrishnan”), and further in view of U.S. Patent No. 6,058,103 to Henderson et al. (“Henderson”), in view U.S. Patent No. 6,212,171 to LaFollette et al. (“LaFollette”).

The Applicant is grateful for the discussion between the Examiner and the Applicant’s representatives on February 17, 2005. The discussion concerned the pending rejections and the references cited by the examiner. Applicant is grateful for the

Examiner's queries regarding various claim terminology. Following the Examiner's invitation, the Applicant submits the following remarks. In light of these remarks, the Applicant offers that the claims are allowable under § 103(a) and respectfully requests that the pending rejections be withdrawn.

A. The Combination of References in the Pending Rejections Is Improper Under § 103(a).

The Applicant offers that the references cited in the rejection of independent claims 27, 40, and 53 were improperly used in combination under § 103(a). As explained in the Manual of Patent Examination and Procedure (MPEP), references may be combined in a rejection under § 103(a) "where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP § 2143.01, discussing *In re Kotzab*, 217 F.3d 1365, (Fed. Cir. 2000). However, "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." *Id.*, discussing *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990).

In the pending rejections, the Applicant sees no suggestion for the desirability of the combination references used. The rejection of independent claim 27, for example, is based on material in four separate references: *Claffery*, *Ramakrishnan*, *Henderson*, and *LaFollette*. These four references pertain to four somewhat disparate technologies. *Claffery* relates to communications networks, particularly chains of ground stations and satellite constellations and other networks in which the availability of links is in a constant state of change. *Claffery* at col. 1, lines 1-18. *Ramakrishnan* relates to routing

in data networks that use centralized assignments of link metrics. *Ramakrishnan* at col. 1, lines 9-14. *Henderson* relates to telecommunications networks, and particularly to techniques for managing networks with diverse network elements conforming to a variety of telecommunications protocols. *Henderson* at col. 1, lines 8-12. *LaFollette* relates to serial interface bus technology, such as IEEE 1394 interfaces, and the analysis of gap counts on a serial bus. *LaFollette* at col. 1, lines 6-30. While the cited references pertain generally to the broad fields of networks and communications, the various references discuss disparate subjects. These subjects do not overlap to the extent that a person having ordinary skill in any one of the respective arts would be cognizant of all the cited references.

Rather, while a person having skill in the art of satellite network operation may be cognizant of the *Claffery* reference, he or she would not be motivated to combine this reference with any of the other three cited references. *Claffery* particularly addresses the issue of networks whose links are intermittently available, for example as in the case of communications satellites in low earth orbit, which continuously move in and out of contact with terrestrial transceivers below. *Claffery* at col. 1, lines 1-18, 40-52. *Claffery* focuses on assessing and re-assessing the network over time, as the availability of various links comes and goes. This reference describes the simulation of a network as it changes over time. The changes are tracked by an index variable, the “Current Evaluation Time (CET),” which marks the passage of time in the simulation. *Id.* at col. 6, lines 10-21. The CET is stepped through time, in increments that correspond to changes in the availability of one or more links. *Id.* at col. 3, lines 39-49. An assessment of the network, such as a matrix noting the availability of various links, is repeated at each evaluation time. *Id.* at col. 6, lines 21-30, col. 8, lines 26-32.

Claffery describes the analysis of a network that evolves in time. This reference has very little discussion of the analysis at each of the evaluation times. The analysis at each moment in time is essentially a search for a “Least Cost” path through the network at that moment in time. *Id.* at col. 9, lines 38-52. *Claffery* is thus limited in applicability to networks in which “the availability of the links is in a constant state of change.” *Id.* at col. 1, lines 1-18. The *Claffery* disclosure is not relevant to the types of networks discussed in *Ramakrishnan*, *Henderson*, or *LaFollette*. A person having ordinary skill in the relevant arts of *Ramakrishnan*, *Henderson*, or *LaFollette* would not be motivated to combine those references with *Claffery*.

Accordingly, the Applicant offers that the combination of *Claffery* with the other cited references is improper. For similar reasons, Applicant offers that the combinations of *Ramakrishnan*, of *Henderson*, and of *LaFollette* with the respective other cited references are also improper. Applicant respectfully requests that the rejections under § 103(a) be withdrawn as relying on an improper combination of references.

B. The Cited Art Does Not Disclose All the Limitations of the Claimed Invention.

Without conceding the propriety of the combination of references cited in the pending rejections, but to further the discussion of this case, the Applicant notes that the cited references fail to describe or suggest, either separately or in combination, all the limitations of the claimed invention. Thus, even if the combination of cited references were proper, the claimed invention is patentable over the cited references under § 103(a).

For example, claim 27 is directed to a computer system and includes a limitation of computer code configured to cause a processor to generate a first matrix with **“independent rows and non-independent rows.”** An illustration of the independent and dependent rows of the first matrix may be seen in the originally filed specification.

Consider the row vectors, F_k , $k = 1, 2, \dots, P$ and let Q be the maximum number of independent row vectors. As can be seen, Q is equal to the rank of matrix F (i.e., $\text{Rank}(F)$). Without loss of generality, $F_1 F_2 \dots F_Q$ be the independent row vectors of matrix F . This is without loss of generality because the row vectors F_k in F (and similarly the corresponding pairs of routers in Φ) can be re-arranged, if necessary. Then, every row vector F_k , $k = Q+1, Q+2, \dots, P$, can be expressed as a linear combination of row vectors, F_k , $k = 1, 2, \dots, Q$.

Specification, at p. 20, lines 23-29.

Thus, the “independent rows” and “non-independent rows” may be understood in the context of linear algebra, where the non-independent rows of a matrix may be recognized as linear combinations of the independent rows.

An example of the relationship between independent and non-independent rows is also presented.

If F_1, F_2, \dots, F_Q is a maximal set of linearly independent rows of F , then row vectors $F_{Q+1}, F_{Q+2}, \dots, F_P$ can be expressed as a linear combination of

F_1, F_2, \dots, F_Q . In other words, F_k can be expressed in terms of:

$$F_k = \sum_{i=1, \dots, Q} (\alpha_{k,i} F_i), k = Q+1, Q+2, \dots, P \quad (15)$$

Specification, at p. 20, line 31 – p. 32, line 1.

In claim 27, the computer code is also configured to cause the processor to form a second set of network element pairs, with “**independent network element pairs.**” Each one of the independent pairs of network element corresponds to a one of the independent rows of the first matrix.

Neither *Claffery*, *Ramakrishnan*, *Henderson*, nor *LaFollette* describe or suggest these limitations, among others, of independent claim 27. Indeed, the Applicant sees no use of the properties of independent and non-independent rows of matrices, in the context discussed above, in any of the cited references. Since at least these limitations of the claim are absent from the cited references, Claim 27 is allowable under § 103(a).

For similar reasons, the cited references also do not describe or suggest all the limitations of independent claims 40 and 53. Claims 40 and 53 are therefore also allowable under § 103(a). Claims 28-30, 32-36, and 38-39 depend on claim 27. Claims 41-43, 45-49, and 51-52 depend on claim 40. Claims 54-59 depend on claim 53. Accordingly, claims 28-30, 32-36, 38-39, 41-43, 45-49, 51-52, and 54-59 are also allowable for at least the same reasons as claims 27, 40, and 53. The Applicant therefore respectfully requests that the pending rejections under § 103(a) be withdrawn.

CONCLUSION

In view of the amendments and remarks set forth herein, the application is believed to be in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is invited to telephone the undersigned at 512-439-5097.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on **March 8, 2005**.



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Date of Signature

Respectfully submitted,

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